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REMARKS

I. Status of the Claims

Claims 1-21 were pending in this application. Claims 1-6, 10-11, and 14- 21 were canceled from consideration by the Examiner as being directed to a non-elected invention. Claims 7-9 were amended to further clarify the applicant's invention. Support for the amendments to claims 7 and 9 can be found, for example, on page 68, line 28 to page 69, line 6 of Example 1 and throughout the application as originally filed. Support for amendments made to claim 8 can be found, for example, on page 16, lines 26-29, page 19, line 14 to page 20, line 10, and page 20, line 24 to page 21, line 6. Thus, the amendments do not introduce new matter. Claims 7-9, 12, and 13 are currently pending in this application.

II. Claim Objections

Examiner objected to claims 7-9, 12-13, and 20 for allegedly depending on, or containing non-elected invention. In view of the present amendment, the Applicants respectfully submit that the objections are moot. Withdrawal of the objections is in order and is respectfully requested. .

III. Claim Rejections under 35 U.S.C. §11, 2 first paragraph

a. Written Description Rejection of claims 7-9, 12, 13 and 20

Claims 7-9, 12, 13, and 20 stand rejected under 35 U.S.C. §112, first paragraph, for allegedly failing to comply with the written description requirement. Specifically, the Examiner alleged that the specification fails to describe additional representative species of these polypeptides by any identifying structural characteristics or properties other than the amino acid sequence of SEQ ID NO:2 of claim 8(a), or the activity cited in claim 20, for which no predictability of structure to function is apparent. Applicants traverse the rejection. Claim 20 has been cancelled and thus the rejection, as applied to that claim, is now moot.

Contrary to the Examiner's position, the specification provides ample examples of JNK activating phosphatase (JKAP) sequence variants, and fragments. Furthermore,

amended claims 7 and 9 recite specific hybridization condition as described, for example, on pages 68-69. Amended claim 8 recites an ortholog, or allelic or splice variant wherein the ortholog or variant has an activity of regulating JNK activation or modulating JNK signal mediated signal transduction. The specification discloses structural characteristics, domain analysis, and mutational analysis of JKAP in, for instance, Example 3, Example 6, and Example 7. Thus, the specification provides sufficient support for the claimed invention, and one skilled in the art would recognize that Applicants were in possession of the claimed invention. Withdrawal of the rejection of claims 7-9, 12 and 13 under 35 U.S.C. §112, first paragraph (written description), is in order and is respectfully requested.

b. Enablement Rejection of claims 7-9, 12, 13, and 20

Claims 7-9, 12, 13, and 20 were also rejected under 35 U.S.C. §112, first paragraph, for allegedly failing to comply with the enablement requirement. Specifically, the Examiner alleged that undue experimentation is required to practice the claimed invention. Claim 20 has been canceled and thus the rejection as applied that that claim is moot. Applicants respectfully traverse the rejection.

Factors to be considered in determining whether the disclosure provides sufficient enablement to practice the claimed invention, and thus does not require undue experimentation, are summarized in *In re Wands* (858 F.2d 731, 737, 8 U.S.P.Q.2d 1400, 1404 (Fed Cir. 1988)). The factors include (a) the breadth of the claim, (b) the nature of the invention, (c) the state of the prior art, (d) the level of skill of one of ordinary skill in the art, (e) the level of predictability in the art, (f) the amount of direction provided by the inventor, (g) the existing of working examples, and (h) the quantity of experimentation needed to make and use the invention based on the content of the disclosure.

The current pending claims recite JKAP polypeptide, variants thereof, fusion protein containing the same, and fragments having an activity of regulating JNK activation or modulating JNK signal mediated signal transduction. The claim breadth is not overly broad, and is supported by the disclosure. The nature of the invention is an isolated or expressed polypeptide. Protein isolation and expression is routine in the art, and the catalytic domain of dual specificity phosphatase is well defined in the art. Thus,

both the nature of invention and state of prior art are in favor of enablement. The Examiner admitted that the level of skill in molecular biological techniques and genetic manipulation is high. The level of predictability of protein isolation, expression and synthesis, and analysis of phosphatase or kinase activity is average, and the level of predictability would be greatly increased by the present disclosure. Finally, the amount of guidance and examples in the present application is high; the specification provides JKAP amino acid sequences corresponding to human and mouse JKAP as set forth in SEQ ID NOs:2 and 4; and extensive functional and structural analysis has been provided, for example, on page 83, first full paragraph, Examples 3, 6, 7, and 10, and throughout the application as originally filed. Thus, the quantity of experimentation needed to practice the invention based on the disclosure would not be undue.

Further, claims 7 and 9 as amended recite specific hybridization conditions as described in, for instance, page 68 to 69 of Example 1. With respect to amended claim 8, the specification fully enables one skilled in the art as to how to determine the activity of JKAP and variants thereof. *See* for example, page 78 and Example 6.

In view of the above discussion, the Applicants submit that the pending claims are fully enabled by the disclosure. Withdrawal of the rejection of claims 7-9, 12, and 13 under 35 U.S.C. §112, first paragraph (enablement), is in order and is respectfully requested.

IV. Claim Rejections under 35 U.S.C. §112, Second paragraph

Claims 7, 9, and 20 stand rejected under 35 U.S.C. §112 second paragraph for allegedly being indefinite. Specifically, the Examiner alleged that recitation of "greater than 100" and "hybridizes under stringent conditions" render the claims indefinite. Claim 20 has been cancelled and thus the rejection, as applied to that claim, is moot. Applicants respectfully traverse the rejection.

A JKAP polypeptide fragment containing greater than 100 amino acid residues of the polypeptide encoded by SEQ ID NO:1 wherein the polypeptide fragment has an activity of regulating JNK activation or modulating JNK mediated signal transduction would be well understood by the ordinary skilled artisan. Furthermore, the phrase "stringent conditions" would be well understood by one with ordinary skill in the art in

light of the specification, for example, on pages 17-18 and Example 1. Amended claims 7 and 9, as amended, specifically recites specific hybridization conditions as described in Example 1.

In view of the above discussion, the Applicants submit that the rejection is moot in view of the present amendment. Withdrawal of the 35 U.S.C. §112, Second paragraph, rejection of claims 7-9, 12 and 13 is in order and is respectfully requested.

V. Claim Rejections under 35 U.S.C. §102(e)

Claims 7-9, and 20 stand rejected under 35 U.S.C. §102(e) as being allegedly anticipated by Luche et al. (U.S. Pub. No. US2005/0176124, hereinafter "the '124 application") Specifically, the Examiner alleged that the present claims are anticipated because that SEQ ID NO:2 of the '124 application (DSP-3) is more than 80% identical to the SEQ ID NO:2 of the instant application; that both sequences have dual specificity phosphatase activity; and that the sequence disclosed in the '124 application is an allelic variants of SEQ ID NO:2 of the claimed invention. As claim 20 is now canceled, the Applicants submit that the rejection, as applied to that claim, is moot. The Applicants respectfully traverse the rejection.

As a threshold matter, the Federal Circuit has stated that for prior art to anticipate under section 102, every element of the claimed invention must be identically disclosed in a single reference. Corning Glass Works v. Sumitomo Electric, 9 U.S.P.Q.2d 1962, 1965 (Fed. Cir. 1989). The exclusion of a claimed element, no matter how insubstantial or obvious, from a reference is enough to negate anticipation. Connell v. Sears, Roebuck & Co., 220 U.S.P.Q 193, 1098 (Fed. Cir. 1983). Contrary to the Examiner's position, the '124 application does not anticipate the claimed invention.

The '124 application merely relates to a dual specificity phosphatase that regulates a "MAP kinase", but not a "JNK", activity. The MAP kinase superfamily consists of three major subfamilies: ERK, JNK, and p38. *See* Tanoue et al. J. Biol. Chem. 274:19949-56 (1999)("Tanoue")(attached). It was known in the art at the time of invention that dual specificity phosphatases are highly selective in their substrate specificities for different MAP kinases. (*See* Tanoue et al. Abstract.) For example, the dual specificity phosphatase MKP-5 modulates and inactivates p38 and JNK, but not

ERK, of the MAP kinase family. (*See* Tanoue et al. Figure 4.) Similarly, Muda et al. teaches another dual specificity phosphatase M3/6 that selectively regulates and inactivates JNK, but not ERK or p38, of the MAP kinase family. *See* Muda et al. J. Biol. Chem. 271:27205-08 (1996) Figure 2 ("Muda") (attached). Thus, at the time of the invention, one of ordinary skill in the art would have known that a dual specificity phosphatase having substrate specificity for one MAP kinase does not necessarily possess substrate specificity for another. The '124 application does not teach a dual specificity phosphatase that regulates the JNK activity. Thus, the '124 application does not teach every element of the claimed invention, and rejection based thereon under 35 U.S.C. 102 (e) is improper.

Secondly, a genus will anticipate a species if one of ordinary skill in the art will "at once envisage" the species within the genus. M.P.E.P. §2131.02. The MAP kinase superfamily encompasses JNK. In view of Tanoue and Muda that dual specificity phosphatases are highly selective in their substrate specificity, one of ordinary skill in the art would not have "at once envisaged" JNK from the MAP kinase superfamily as the substrate of DSP-3. Thus, the general disclosure of the '124 application does not anticipate the specifically claimed invention.

Based on the foregoing, the Applicants respectfully submit that the 35 U.S.C. §102(e) rejection of claims 7-9 based on the '124 application is improper and should be withdrawn.

VI. Claim Rejections under 35 U.S.C. §103(a)

Claims 12 and 13 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the '124 application and in view of Ford et al. (Protein Expression and Purification 1991, 2, 95-107, hereinafter "Ford"). The Examiner contended that the '124 application would have provided one skilled in the art the motivation to identify modulators of DSP-3 by first producing DSP-3 in large quantity as a fusion protein, the method of which is said to be taught in Ford. The Applicants respectfully traverse the rejection.

The Federal Circuit reiterated the manner in which obviousness rejections are to be reviewed. Where claimed subject matter has been rejected as obvious in view of a combination of prior art references, "a proper analysis under § 103 requires, *inter alia*,

consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success." *In re Vaeck*, 947 F.2d 488, 493, 20 U.S.P.Q.2d 1438, 1485 (Fed. Cir. 1991), citing *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 U.S.P.Q. 2d 1529, 1531 (Fed. Cir. 1988). Contrary to the Examiner's position, the Applicants submit that the '124 application and Ford, alone or in combination, does not teach or suggest what the Applicants have done.

As set forth above, the '124 application does not teach a dual specificity phosphatase that modulates JNK activity, and Ford does not cure that defect. Ford merely relates to the production and purification of a fusion protein in general. Ford does not teach the production and purification of a dual specificity phosphatase that modulates JNK activity. The cited art, either alone or in combination, does not teach every element of the claim. A person of ordinary skill in the art would not have been motivated by the '124 application to produce the DSP-3 polypeptide as a fusion protein and teachings related to general production and purification of fusion protein with any expectation that the fusion protein will have substrate specificity for JNK. Hence, the subject matter of claims 12 and 13, as a whole, would not have been obvious in view of the '124 application and Ford. Withdrawal of the 35 U.S.C. §103(a) rejection of claims 12 and 13 is in order and is respectfully requested.

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VII. Conclusion

The Applicants believe that the application is ready for allowance. A favorable decision is earnestly solicited. A copy of cited references is included for Examiner's review. If the Examiner has any question, he is invited to call the undersigned attorney at 312-913-2126.

Respectfully submitted,

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